

Application Serial No.: 09/809,074  
Reply to Office Action dated February 24, 2004

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An optical transmission system comprising a light source configured to produce an optical signal, said light source comprising a plurality of densely placed laser diode modules, each of said plurality of densely placed laser diode modules being mounted on a peltier device that is mounted on a mounting portion, each of said plurality of densely placed laser diode modules having an output of at least 100 mW, and a plurality of heat pipes thermally connected to said mounting portion, said plurality of heat pipes having a heat absorbing portion and a heat radiating portion with heat radiating fins.

2. (Canceled)

3. (Currently Amended) An optical transmission system comprising a light source configured to produce an optical signal, said light source comprising:

~~at least one a plurality of laser diode module modules~~ including a metal substrate mounting a laser diode chip and an optical component, and a peltier device thermally connected with said metal substrate; and

a plurality of heat pipe pipes having a heat absorbing portion and a heat radiating portion with heat radiating fins, said heat absorbing portion of said heat pipe being thermally connected with said peltier device, each of said plurality of heat pipes being thermally connected with a respective one of said plurality of laser diode modules; and

~~a plurality of laser diode modules each including a metal substrate mounting a laser diode chip and an optical component.~~

4. (Canceled)

5. (Previously Presented) A light source, comprising:

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a plurality of laser diode modules each including a metal substrate mounting a laser diode chip and an optical component, and a peltier device thermally connected with said metal substrate;

a plurality of heat pipes each having a heat absorbing portion and a heat radiating portion, said heat absorbing portion being thermally connected with said peltier device, said plurality of heat pipes being thermally connected with said plurality of laser diode modules; and

a mounting portion having said plurality of laser diode modules mounted thereon, said mounting portion having holes configured to receive heat absorbing portions of said plurality of heat pipes along a lengthwise direction of said respective one of said plurality of laser diode modules, said respective one of said plurality of laser diode modules being thermally connected with a respective one of said plurality of heat pipes received in said holes.

6. (Currently Amended) The optical transmission system according to Claim [[4]] 3, further comprising heat radiating fins provided on heat radiating portions of said plurality of heat pipes.

7. (Currently Amended) The optical transmission system according to Claim 3, wherein each heat pipe of said plurality of heat pipe pipes is cylindrical in shape.

8. (Currently Amended) ~~The An~~ optical transmission system according to Claim 7 comprising a light source configured to produce an optical signal, said light source comprising:

a plurality of laser diode modules each including a metal substrate mounting a laser diode chip and an optical component, and a peltier device thermally connected with said metal substrate; and

a heat pipe having a heat absorbing portion and a heat radiating portion with heat radiating fins, said heat absorbing portion of said heat pipe being thermally connected with said peltier device,

wherein said heat pipe is cylindrical in shape,

wherein at least one laser diode module of said plurality of laser diode module modules has a bottom portion that includes a curved surface portion, and

wherein said heat pipe is tightly connected to said curved surface portion.

9. (Previously Presented) A light source, comprising:

at least one laser diode module including a metal substrate mounting a laser diode chip and an optical component, and a peltier device thermally connected with said metal substrate;

a heat pipe having a heat absorbing portion and a heat radiating portion with heat radiating fins, said heat absorbing portion of said heat pipe being thermally connected with said peltier device;

a mounting portion having said laser diode module mounted thereon; and

a plurality of heat radiating fins provided on a bottom surface of said mounting portion.

10. (Canceled)

11. (Canceled)

12. (Currently Amended) An optical transmission system comprising a Raman amplifier comprising a light source configured to produce an optical signal, said light source including a plurality of densely placed laser diode modules, each of said plurality of densely placed laser diode modules being mounted on a peltier device that is mounted on a mounting

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portion, each of said plurality of densely placed laser diode modules having an output of at least 100 mW, and a plurality of heat pipes thermally connected to said mounting portion, said plurality of heat pipes having a heat absorbing portion and a heat radiating portion with heat radiating fins.

13. (Canceled)

14. (Previously Presented) An optical transmission system comprising a light source configured to produce an optical signal, said light source comprising:  
a laser diode module including a laser diode chip, an optical component, and a peltier device, said laser diode chip and said optical component being supported by said peltier device;

a mounting portion having said peltier device mounted thereon such that said peltier device is thermally connected with said mounting portion;

at least one heat pipe having a first portion extending within said mounting portion and a second portion with heat radiating fins extending from a side of said mounting portion, said heat pipe having an interior with a heat transfer fluid therein; and

a plurality of heat radiating fins provided on a bottom surface of said mounting portion.

15. (Previously Presented) The optical transmission system according to Claim 14, wherein said mounting portion is made of a metal.

16. (Previously Presented) The optical transmission system according to Claim 14, further comprising a plurality of densely placed laser diode modules, each of said plurality of densely placed laser diode modules having an output of at least 100 mW.

17. (Previously Presented) The optical transmission system according to Claim 14,

further comprising a plurality of laser diode modules each including a metal substrate mounting a laser diode chip and an optical component, and a peltier device thermally connected with said metal substrate.

18. (Previously Presented) The optical transmission system according to Claim 17, further comprising a plurality of heat pipes, each of said plurality of heat pipes being thermally connected with a respective one of said plurality of laser diode modules.

19. (Previously Presented) A light source comprising:  
a plurality of laser diode modules each including a laser diode chip, an optical component, and a peltier device, said laser diode chip and said optical component being supported by said peltier device, each laser diode module including a metal substrate mounting said laser diode chip and said optical component, and said peltier device being thermally connected with said metal substrate;

a mounting portion having said peltier devices mounted thereon such that said peltier devices are thermally connected with said mounting portion; and

a plurality of heat pipes each having a heat absorbing portion extending within said mounting portion and a heat radiating portion extending from a side of said mounting portion, said plurality of heat pipes each having an interior with a heat transfer fluid therein, said plurality of heat pipes being thermally connected with said plurality of laser diode modules,

wherein said mounting portion has holes configured to receive heat absorbing portions of said plurality of heat pipes along a lengthwise direction of said respective one of said plurality of laser diode modules, said respective one of said plurality of laser diode modules being thermally connected with a respective one of said plurality of heat pipes received in said holes.

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20. (Canceled)

21. (Previously Presented) The optical transmission system according to Claim 14, wherein said heat pipe is cylindrical in shape.

22. (Previously Presented) The optical transmission system according to Claim 21, wherein said laser diode module has a bottom portion that includes a curved surface portion, and wherein said heat pipe is tightly connected to said curved surface portion.

23. (Previously Presented) A light source comprising:

a laser diode module including a laser diode chip, an optical component, and a peltier device, said laser diode chip and said optical component being supported by said peltier device;

a mounting portion having said peltier device mounted thereon such that said peltier device is thermally connected with said mounting portion;

at least one heat pipe having a first portion extending within said mounting portion and a second portion with heat radiating fins extending from a side of said mounting portion, said heat pipe having an interior with a heat transfer fluid therein; and

a plurality of heat radiating fins provided on a bottom surface of said mounting portion.

24. (Canceled)

25. (Canceled)